Cleveland Clinic - Medically Reviewed

Last reviewed on 04/07/2022.

https://my.clevelandclinic.org/health/diseases/17978-angelman-syndrome

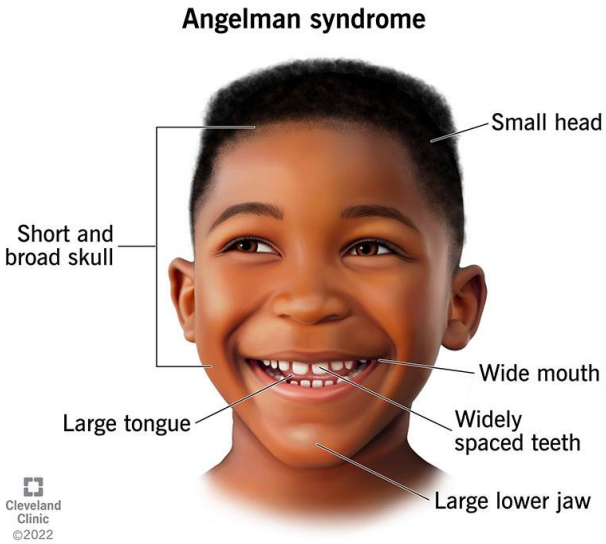
Angelman Syndrome

Angelman syndrome is a rare and complex neurodevelopmental condition that causes developmental delays, intellectual disabilities, speech impairments and movement issues. It's caused by issues with a specific gene called UBE3A that happens during fetal development.

Cleveland Clinic is a non-profit academic medical center.

Angelman syndrome may cause some distinct facial characteristics in addition to neurological symptoms.

What is Angelman syndrome?



Angelman syndrome is a rare, complex neurodevelopmental condition that primarily affects your nervous system. It's caused by issues with a specific gene called *UBE3A.*

Your nervous system is your body's command center. Originating from your brain, it controls your movements, thoughts, behaviors and automatic responses to the world around you.

Characteristic features of Angelman syndrome include:

- Developmental delay that's often noticeable by six to 12 months of age.
- Intellectual disability.
- No speech or very limited speech.
- Issues with movement and balance (ataxia).
- Seizures.

Children with Angelman syndrome typically have a happy, excitable attitude. They frequently smile, laugh and make hand-flapping motions.

Angelman syndrome is named after Dr. Harry Angelman, an English physician who first described the condition in medical literature in 1965.

Who does Angelman syndrome affect?

Although Angelman syndrome is rare, it can develop in any fetus. The majority of cases result from a spontaneous gene mutation, meaning the condition isn't passed down from biological parent(s) to child.

How common is Angelman syndrome?

Angelman syndrome is rare. It affects approximately 1 in 12,000 to 20,000 people.

Is Angelman syndrome on the autism spectrum?

Autism spectrum disorder and Angelman syndrome share some of the same characteristics, such as developmental delay and speech issues, and are particularly difficult to tell apart during the early stages of development. However, Angelman syndrome isn't part of the autism spectrum. They are distinct conditions.

Symptoms and Causes

What are the symptoms of Angelman syndrome?

Angelman syndrome has several different symptoms, or characteristics, and they vary from person to person and with age.

Common symptoms of Angelman syndrome

Most people with Angelman syndrome (approximately 80% to 99%) have the following symptoms throughout their lives:

- Delayed development.
- Learning disabilities.
- Speech development issues, ranging from not speaking at all (being nonverbal) to only using a few words.
- Walking difficulties, such as clumsiness and a wide-based walk (gait).
- Ataxia (impaired balance or coordination).
- Seizures.

Facial features of Angelman syndrome

Common facial features of Angelman syndrome include:

- A short and broad skull (brachycephaly).
- Abnormally large tongue (macroglossia) that may stick out of their mouth.
- Abnormally small head (microcephaly).
- A big lower jaw (mandibular prognathia).
- Wide mouth.
- Widely spaced teeth.

Symptoms of Angelman syndrome specific to children

Children with Angelman syndrome typically have distinctive behaviors (in addition to the characteristic symptoms), including:

- A happy, excitable attitude.
- Frequent smiling and laughing.
- Frequent hand-flapping motions.
- Hyperactivity and a short attention span.

- Difficulty sleeping and needing less sleep than other children.
- A fascination with water.

With age, people with Angelman syndrome become less excitable, and their sleeping problems tend to improve.

What causes Angelman syndrome?

Many of the characteristic symptoms of Angelman syndrome result from the loss of function of a gene called *UBE3A*. These changes occur early in fetal development before a baby is born.

A genetic mutation is a change in a sequence of your DNA. Your DNA sequence gives your cells the information they need to perform their functions. If part of your DNA sequence isn't complete or is damaged, you might experience symptoms of a genetic condition.

People normally inherit one copy of the *UBE3A* gene from each biological parent. Both copies of this gene are "turned on" (active) in many of your body's tissues. But in certain areas of your brain, only the copy inherited from your mother is active.

If the maternal copy of the *UBE3A* gene is lost because of a chromosomal change or a gene mutation, you'll have no active copies of the gene in some parts of your brain. This causes the characteristic symptoms of Angelman syndrome, a neurodevelopmental condition.

You may have Angelman syndrome symptoms because parts of the *UBE3A* gene are inactive or missing (about 70% of cases). Structural changes to *UBE3A* may also result in Angelman syndrome (about 11% of cases).

Abnormalities of the *UBE3A* gene usually occur spontaneously (randomly), meaning they aren't inherited (passed down). In a small number of cases, children don't inherit a normal copy of chromosome 15 from their mother (for example, they could inherit two copies of chromosome 15 from their other biological parent), leading to the development of Angelman syndrome.

In about 10% to 15% of cases, healthcare providers can't determine the cause of Angelman syndrome. Changes involving other genes or chromosomes may be responsible for the condition in these cases.

Diagnosis and Tests

How is Angelman syndrome diagnosed?

The characteristic symptoms of Angelman syndrome aren't usually apparent at birth. Healthcare providers typically diagnose the condition in children between one and four years of age. But this can vary because Angelman syndrome has such a wide range of symptoms and severity.

Angelman syndrome is also easily misdiagnosed as other conditions that closely resemble it, including:

- Autism spectrum disorder.
- Cerebral palsy.
- Mowat-Wilson syndrome.
- Christianson syndrome.

- Pitt-Hopkins syndrome.
- Prader-Willi syndrome.
- Phelan-McDermid syndrome.

The only certain way to diagnose Angelman syndrome is with genetic testing that identifies changes to the *UBE3A* gene.

What tests are used to diagnose Angelman syndrome?

In most cases, healthcare providers diagnose Angelman syndrome in young children, but they can sometimes identify the condition prenatally (before birth).

Diagnosis of Angelman syndrome before birth

In some cases, healthcare providers can identify Angelman syndrome before your baby is born through a prenatal ultrasound. They look for signs of fetal growth issues.

Current studies have shown that noninvasive prenatal screening (NIPS) is highly accurate in the diagnosis of Angelman syndrome pre-birth. NIPS is a method of determining the risk that your baby will be born with certain genetic abnormalities. This testing analyzes small fragments of DNA that are circulating in a mother's blood.

Diagnosis of Angelman syndrome after birth

In most cases, providers diagnose Angelman syndrome in children between one and four years of age. They may suspect the condition if your child's development is delayed and they have the syndrome's distinctive characteristics.

Providers use a variety of specialized blood tests to confirm the diagnosis of Angelman syndrome. Laboratory scientists perform several genetic tests that look for:

- Any chromosomes or pieces of chromosomes that are missing.
- Changes in your child's *UBE3A* gene that would stop it from working.
- Changes in either biological parent's *UBE3A* gene that they may have passed on.

If your child has Angelman syndrome, it's important to know the genetic change that caused it. This helps to determine whether there's a chance you might have another child with Angelman syndrome.

Your child's provider may also order the following tests to help with the diagnosis or to check for possible complications:

- Electroencephalogram (EEG): An EEG measures and records your child's brain's electrical signals. During an EEG, a technician places small metal disks (electrodes) on your child's scalp. The electrodes attach to a machine that gives their healthcare provider information about your child's brain's activity. This test can show a characteristic brain activity pattern of Angelman syndrome and any epileptic activity, which can help in the diagnosis.
- Sleep study **(polysomnography)**: This test can diagnose any sleep disorders, which are common in children with Angelman syndrome.

Management and Treatment

How is Angelman syndrome treated?

There’s no main treatment for Angelman syndrome. Instead, healthcare providers focus treatment on the specific symptoms that each child with Angelman syndrome has. Early diagnosis and treatment are key to helping a child with Angelman syndrome maintain the highest possible quality of life.

Treatment may require the coordinated efforts of a team of specialists, including:

- Pediatricians.
- Neurologists.
- Occupational and physical therapists.
- Speech-language pathologists.
- Behavioral therapists.
- Gastroenterologists.
- Nutritionists.

Symptom management may include interventions and treatments like:

- Anti-seizure medications (anticonvulsants) for those who experience seizures.
- Physical therapy to help with posture, balance and walking issues and to prevent joint stiffness.
- Use of ankle or foot braces to aid walking.
- Behavioral therapy and adherence to strict bedtime routines to help sleep disorders.
- Behavioral modification therapy to help change unwanted behaviors.
- Communication aids and therapies, such as sign language, gesturing and the use of special computer communication devices for improved learning and social communication.

Is there a cure for Angelman syndrome?

There’s currently no cure for Angelman syndrome. Treatment involves managing symptoms of the condition.

Prevention

Can Angelman syndrome be prevented?

Unfortunately, in most cases, there’s no way to prevent Angelman syndrome since it occurs as a result of spontaneous (random) genetic abnormalities while the fetus is developing in the uterus. In most cases, this happens without a known cause.

A small percentage of people with Angelman syndrome inherit the condition. If you plan on having a biological child, talk with your healthcare provider about genetic testing to understand your risk of having a child with a genetic condition or a condition that can be caused by an inherited genetic mutation.

Outlook / Prognosis

What can I expect if my child has Angelman syndrome?

It’s important to remember that no two children with Angelman syndrome are affected in the same way. While all people with Angelman syndrome will have some form of developmental delay, speech impairment and movement (motor) impairment, there are many variations in the severity of these symptoms.

It’s impossible to predict with certainty how your child will be affected. The best way you can prepare and help your child get the best care is to talk to healthcare providers who specialize in treating Angelman syndrome.

What is the prognosis (outlook) of Angelman syndrome?

The prognosis (outlook) for someone with Angelman syndrome depends on several factors, including:

- The genetic cause (big deletions of the *UBE3A* gene have a worse prognosis).
- Your child's age at diagnosis.
- The severity of symptoms.
- The level of intervention and therapy your child is able to receive to manage their symptoms.

Most people with Angelman syndrome will have a normal life span. They won’t have any developmental regression, and their behavioral symptoms might improve with self-help skills and supportive care.

Most people with Angelman syndrome need constant care and attention due to their behavior. Prognosis improves significantly with early diagnosis and interventions like speech, physical and occupational therapies.

What is the life expectancy of someone with Angelman syndrome?

The life expectancy of people with Angelman syndrome appears to be nearly normal.

Living With

How can I take care of my child with Angelman syndrome?

To help take care of your child with Angelman syndrome, follow their healthcare providers’ instructions for:

- Giving any medications as prescribed.
- Getting developmental assessments and physical, occupational and speech therapies.
- Going to all follow-up medical visits.

Children with Angelman syndrome will have problems with movement and behavior and will likely need help with daily tasks throughout their lives.

Your child’s healthcare team can answer questions and offer support. They also might be able to recommend a local or online support group.

When should my child see their healthcare provider?

If your child has been diagnosed with Angelman syndrome, they’ll need to see their healthcare team regularly to make sure their treatment and therapies are working.

What questions should I ask my doctor about Angelman syndrome?

If your child has Angelman syndrome, it may be helpful to ask their healthcare providers the following questions:

- Which treatments will be best for managing my child's symptoms?
- How can I help my child communicate better?
- Should I have genetic testing or genetic counseling if I plan on having more children?
- How can I best plan for the support my child will need in the future?
- Is there a support group nearby for families like ours?

A note from Cleveland Clinic

Learning that your child has Angelman syndrome can be overwhelming. Know that you're not alone — many resources are available to help you and your family. It's important that your child has a team of healthcare providers who are familiar with the syndrome so that they can receive the best care.